

couver, Canada; Melbourne and Sidney, Australia. Although the Turnipseed family is well distributed, Turnip still eluded me. I could get no closer to Horse than Horsey, which occurs plentifully. But I found Sheep. That is my *rara avis*; or, more accurately, *rara ovis*!

Those who write reports of the results of

their research seldom mention one influence that helps to shape the course of their endeavors. I refer to the comments of wives. In my case attention was called to the possibility of sometime bringing the search to a close by a gentle remark, "I'm getting a little tired of seeing piles of telephone books around the house."

BOTANY.—*New species of trees from western Ecuador.*¹ ELBERT L. LITTLE, JR.,
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The 19 new species here described and illustrated are from the author's collection of tree specimens made in 1943 in western Ecuador with the Latin American Forest Resources Project of the U. S. Forest Service. Genera represented are: *Heisteria*, *Hirtella* (2), *Brownea* (3), *Humiria*, *Erythrochiton*, *Tetragastris*, *Guarea*, *Trichilia*, *Belotia*, *Matisia* (2), *Clusia* (2), *Neosprucea*, *Symplocos*, and *Aspidosperma*. Twelve species are from the province of Esmeraldas, and others from the provinces of Pichincha, Chimborazo, Los Ríos, and El Oro. Additional new species from this collection are being published elsewhere by specialists, and others must remain undescribed at present because of incomplete material.

Type specimens have been deposited in the U. S. National Herbarium, Washington, D. C., and a set of isotypes in the herbarium of the U. S. Forest Service, Washington, D. C. Additional isotypes of most species are in the following herbaria: Tropical Forest Experiment Station, U. S. Forest Service, Río Piedras, Puerto Rico; Yale University School of Forestry, New Haven, Conn.; Chicago Natural History Museum, Chicago, Ill.; and Instituto Botánica, Universidad Central, Quito, Ecuador.

Acknowledgment is due C. V. Morton, of the U. S. National Museum, for assistance in checking the Latin diagnoses, to Ellsworth P. Killip, also of the National Museum, for suggestions, to Miss Leta Hughey, botanical artist, Forest Service, for making the drawings of the new species, and the late Dean Samuel J. Record, Yale University School of Forestry, for making generic determinations of wood samples of

four of these new species. The Forest Service project in Ecuador is described in the following report: HOLDRIDGE, L. R., et al., *The forests of western and central Ecuador*. 134 pp., illus. Forest Service, U. S. Dept. Agr., Washington, D. C. 1947. (Processed.)

***Heisteria cyathiformis* Little, sp. nov.**

Fig. 7

Sec. Euheisteria Engl. Frutex vel arbor parva 4 m alta, trunco 3 cm diametro, glabra, ramulis gracilibus teretibus viridulis, novellis subangulatis, internodiis brevibus 0.5–3 cm longis. Folia petiolata, petiolis 4–11 mm longis, supra leviter canaliculatis; laminae anguste ellipticae vel oblanceolatae, (5) 8–15 cm longae, 3–5.5 cm latae, basi acutae vel acuminatae, apice subabrupte acuminatae, acumine 4–9 mm longo, membranaceae, margine integrae, costa supra plana subtus elevata, nervis lateralibus utrinque 5–9, prope marginem arcuato-conjunctis, subtus prominulis. Flores fasciculares in axillis 2 vel 3; pedicellus 3 mm longus, apicem versus crassus; albastrum ca. 1.5 mm longum; calyx 1 mm longus ad medium 5-lobus, lobis triangularibus acutis; corolla in alabastro globoso-ellipsoidalis, 1.3 mm longa, viridulo-albida, 5-lobata, intus minute puberulenta; stamina 10, 5 longiora et 5 alternatim breviora; ovarium triangulare, apicem versus acuminatum, 1 mm longum, 1 mm diametro, 3-loculare ovulis 3, stigmatibus minuto sessilibus 3-lobatis. Fructus solitarius, pedicello in stato fructifero 12–15 mm longo, calyce fructifero accrescente cyathiformi, 4–5 mm longo et 7 mm lato, truncato, subintegro vel minute 5-dentato, rubro; drupa ellipsoidalis, 11 mm long, 7 mm diametro, nigra.

Shrub or small tree 4 m tall and 3 cm in trunk diameter, said to become larger. Speci-

¹ Received October 3, 1947.

mens collected from two plants in wet tropical forest at Quinindé. "Aji."

ESMERALDAS: Quinindé, altitude 65 m, April 15, 1943, *Little 6263A* (Forest Service no. 96832; U. S. Nat. Herb. no. 1854915, TYPE). *Little 6263* (Forest Service no. 96833).

Heisteria Jacq. has more than 40 species in South and Central America and 3 in western Africa. Most species have the enlarged calyx of the fruit lobed and rotate, reflexed, or loosely enclosed the drupe. In *H. cyathiformis* the red, cup-shaped or hemispherical calyx is about one-third the length of the black, ellipsoidal drupe (red when immature) and closely adheres to the lower part of the drupe. This enlarged fruiting calyx is truncate and subentire or minutely 5-toothed. Superficially the fruit, with its elongated drupe and cuplike calyx, resembles that of some members of the Lauraceae, though the other characters are unlike that family. Caroline K. Allen and I. W. Bailey kindly have suggested that this material probably belongs in *Heisteria*, where it apparently is undescribed.

Heisteria cyathiformis is related to *H. cyanocarpa* Poepp. & Endl., of the Amazonian region of Brazil, Peru, and Ecuador, which has larger and thicker leaves, more flowers in a fascicle, and the fruiting calyx broad, orbicular, usually reflexed. The collection contains material of another species of this genus, doubtfully referred to the Central American species *H. macrophylla* Oerst.

***Hirtella carbonaria* Little, sp. nov.**

Fig. 3

Arbor mediocris 12 m alta, trunco 25 cm diametro. Cortex laevis, griseus. Ramuli parce hirsutuli mox glabrescentes. Folia petiolata cum stipulis linearibus, ca. 3 mm longis, involutis, strigosis; petiolis ca. 2 mm longis, parce hirsutulis; laminae ellipticae, 5–9 cm longae et 2.5–4 cm latae, basi rotundatae, apice abrupte acuminatae, integrae, inflexae, coriaceae, reticulatae, supra glabrae, subtus in costa et venis pilis paucis subappressis praeditae, venis primariis 5–8-jugis, arcuatis et margine anastomosantibus, his cum costa utrinque paullo elevatis. Inflorescentiae terminales atque axillares, thyrsoformes, multiflorae, cum floribus multis abortivis, 6–9 cm longae et 2–4 cm latae, pedunculo 2–5 cm longo, rhachibus pilos paucos appressos gerentibus; bractee triangulares,

acutae, 1–2 mm. longae; pedicelli 3 mm longi; hypanthium campanulatum, 3 mm longum et 2 mm latum, externe sparse pubescens, intus glabrum; sepala 5, elliptica, obtusa, 3 mm longa et 2.5 mm lata, externe strigillosa, intus densius strigillosa; petala 5, alba, elliptica, 4 mm longa et 2.5 mm lata, retusa, glabra; stamina 3, 8–12 mm longa, filamentis glabris, basi connatis; staminodia 2, 1.5 mm longa; ovarium fere 2 mm longum, dense pilosum; stylus deorsum sparse pilosus, 10–15 mm longus. Drupa ovoidea, 15 mm longa, 8 mm lata, 3.5 mm crassa, compressa, atra, glabrescens, intus dense pilosa; semen ellipsoideum, compressum, fuscum, ca. 10 mm longum, 5 mm latum, 2.5 mm crassum.

Medium-sized tree to 12 m tall and 25 cm in trunk diameter. Bark smooth, gray. Wood used for charcoal, as the common and specific names indicate. Common in moist soil, flood plain forest near Río Nadadero, wet tropical forest zone at San Lorenzo. "Carbonero," "carboncillo."

ESMERALDAS: San Lorenzo, altitude near tidewater, April 19, 1943, *Little 6275* (Forest Service no. 96790; U. S. Nat. Herb. no. 1858838, TYPE).

Besides *Hirtella triandra* Sw., this collection contains two undescribed species of *Hirtella* L. *Hirtella carbonaria* has elliptic, coriaceous, glabrescent leaves that are turned inward slightly at the midrib. The pubescence of twigs, leaves, and inflorescence is rather sparse, consisting generally of a few appressed hairs, which are lost as the parts become nearly glabrous with age. The thyrsoform inflorescence contains many abortive flowers.

***Hirtella pauciflora* Little, sp. nov.**

Fig. 2

Arbor magna 25 m alta, trunco 50 cm diametro. Cortex laevis, leviter fissilis, fuscus. Ramuli dense hirtelli. Folia petiolata cum stipulis linearibus, ca. 3 mm longis, dense hirtellis; petiolis 3–4 mm longis, dense hirtellis; laminae ellipticae, 7–13 cm longae et 3–5 cm latae, basi acutae, apice acuminatae, integrae, membranaceae, pallide virides, supra costis hispidae, pilis paucis rigidis in venis et venulis ferentes, mox glabratae, subtus in venis et venulis hispidae, nervis primariis 6–9-jugis, ascendentes, his cum costa supra leviter impressis, subtus prominentibus. Inflorescentiae

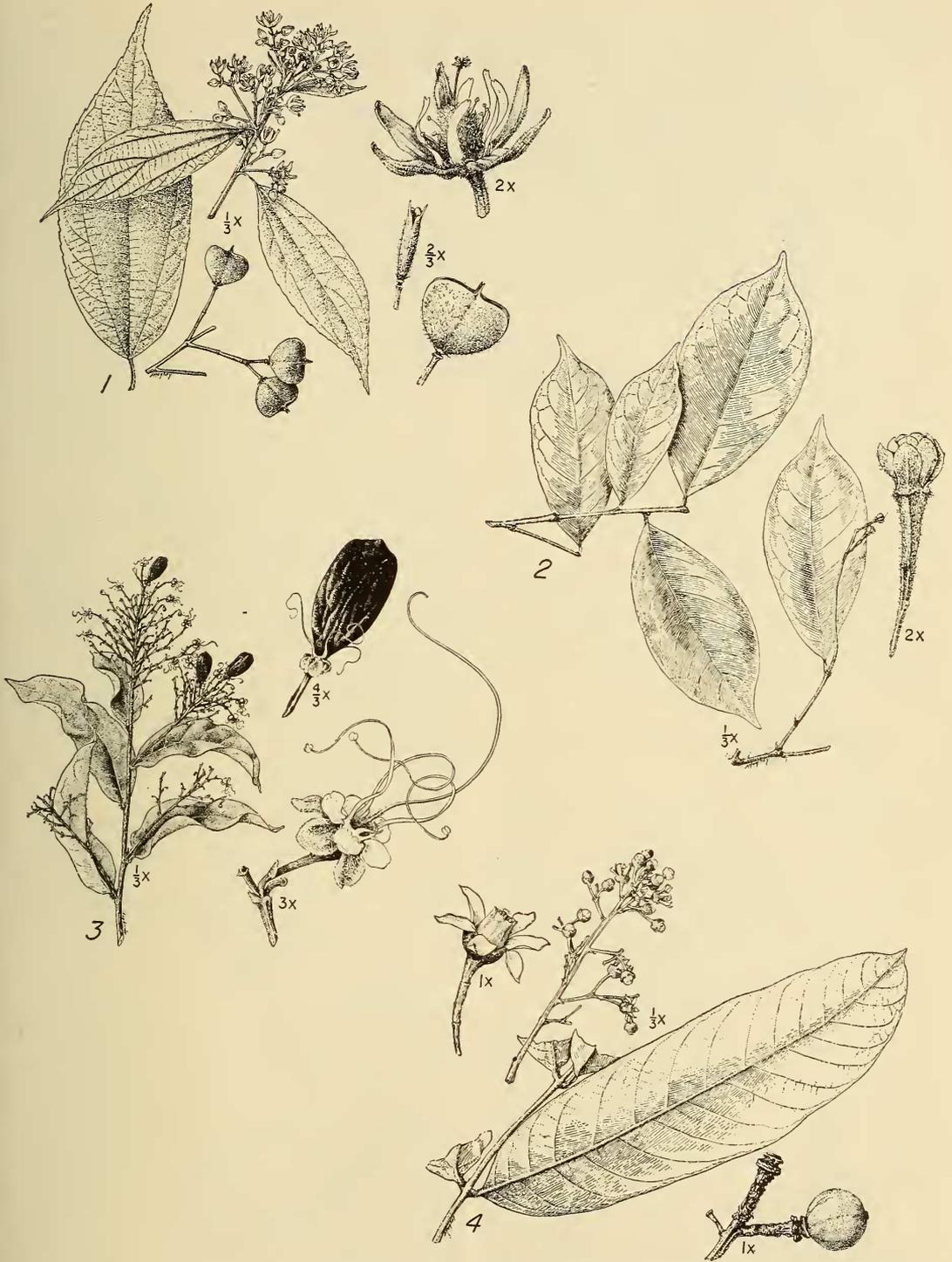


FIG. 1.—*Belotia australis*, $\frac{1}{3}\times$; flower, $2\times$; fruits, $\frac{2}{3}\times$. FIG. 2.—*Hirtella pauciflora*, $\frac{1}{3}\times$; flower, $2\times$. FIG. 3.—*Hirtella carbonaria*, $\frac{1}{3}\times$; flower, about $3\times$; fruit, $\frac{1}{3}\times$. FIG. 4.—*Guarea polymera*, $\frac{1}{3}\times$; flower, $1\times$; fruit, $1\times$.

racemosae terminales in ramulis brevibus, inconspicuae, 2- vel 3-florae, 3-6 cm longae, pedunculo hirtello, 1-4 cm longo; pedicelli crassi, inflati, lignei, 10-12 mm longi, basi fere 1 mm diametro, medio et apice 1.5-2 mm diametro, dense hirtelli; flores viridulo-fusci, ca. 5 mm longi et 5 mm diametro; hypanthium ca. 2 mm longum et 2 mm latum, externe hirtellum, intus fauce dense retrorse pilosum, alibi glabrum; sepala 5, late elliptica, obtusa, 3 mm longa et 2-3 mm lata, externe dense hirtella, intus dense puberula; petala 5, elliptica, obtusa vel retusa, 3 mm longa et fere 2 mm lata; stamina 3, filamentis glabris, basi connatis, 5-7 mm longis; staminodia 2, minuta, 0.2 mm longa; ovarium fere 2 mm longum, dense pilosum; stylus basin versus sparse pilosus, alibi glaber, 4 mm longus. Fructus deest.

Large tree 25 m tall and 50 cm in trunk diameter. Bark smooth, slightly cracked, brown. Virgin wet tropical forest and old cacao plantation at Pichilingue. "Coquito."

Los Ríos: Pichilingue, altitude 45 m, May 21, 1943, *Little 6475* (Forest Service no. 95855; U. S. Nat. Herb. No. 1876218, TYPE).

The inconspicuous, small racemes terminal on short branches and bearing only 2 or 3 flowers distinguish *H. pauciflora*.

Brownea disepala Little, sp. nov.

Fig. 9

Arbor magna 30 m alta; trunco 35 cm diametro, florifero, cum tumoribus ellipsoidalibus magnis et conspicuis, 3-5 cm crassis, 3-5 cm longis, et 3-10 cm latis, cicatricibus inflorescentiarum ferentibus. Cortex griseus, fere laevis; ramuli glabri. Folia paripinnata; petioli crassi, subglabrati, 6-15 mm longi et 3-4 mm diametro; rhachis 20-40 cm longi, fere glabri; petioli crassi, corrugati, 3-5 mm longi, subglabri; foliolae (4) 6-9-jugae, oppositae, oblongo-ellipticae, (5) 9-12 cm longae, (2) 3-4 cm latae, basi inaequales, apice longe caudato-acuminatae, subcoriaceae, nitidae, reticulatae, glabrae, costae basi glande uno minuto gerentes. Inflorescentia caulina capitata, strobiliformis, globosa, sessilis, pallide incarnata, 5 cm diametro; bracteae multae, subrotundae vel ovatae vel oblongae, valde concavae, 1-7 cm longae, externe dense tomentosae, intus glabrae vel leviter pilosae, exteriores satis crassae et coriaceae, interiores membranaceae; rhachis 2.5-3 cm longa et 8-10 mm diametro, ad

$\frac{2}{3}$ longitudinis bracteata, apicem versus florifera. Flores multi (ca. 30-40), albi; pedicelli 10-18 mm longi, pilosuli; vagina nulla; hypanthium campanulatum, subtetragonum, 8 mm longum, 5-6 mm latum, pilosulum; sepala 2, oblanceolata vel oblonga, apice bidentata dentibus 3-5 mm longis, pilosula vel glabrata, nervis parallelis, 30-50 mm longa et 10-15 mm lata; petala 4, longe angustaque unguiculata, glabrata, pinninervia, 2 majora oblanceolata, obtusa, 37-43 mm longa et 10 mm lata, 2 minora lineari-spathulata, acuta, 25-27 mm longa et 3 mm lata; vagina staminalis 3 cm longa, pilosula; stamina 17 vel 18, filamentis 25-50 mm longis, antheris 5-6 mm longis; ovarium stipitatum (6 mm), 15 mm longum, 2.5 mm latum, compressum, dense tomentosum; stylus glaber, 50-60 mm longus; stigma capitellatum. Legumen paucum, ca. 15 cm longum, 4 cm latum, plano-compressum, rufopuberulum, valvis post dehiscenciam tortuosis.

Large tree 30 m tall and 35 cm in trunk diameter, distinguished by cauliflory. Bark gray, smoothish. Trunk easily recognized by the enlarged elliptical swellings at scars of former inflorescences. The large whitish flowers are borne in a headlike cluster from a spherical pink, bracteate, strobiliform bud about 5 cm in diameter which is sessile on the trunk. From the flower cluster a few large flat pods develop. Mountain (wet tropical) forest in southwestern Ecuador. "Palo de vaina."

EL ORO: Near Piedras, altitude about 800 m, June 21, 1943, *Little 6677* (Forest Service no. 98587; U. S. Nat. Herb. no. 1857106 and 1857107, TYPE). GUAYAS: Near Pedro Carbo, altitude about 300 m, Jan. 13, 1943, *Oscar Haught 3131* (U. S. Nat. Herb.).

Haught 3131 has flowers similar to those of the type but differs in having the leaflets slightly smaller (5-7 cm long and 2-2.5 cm broad). It is described by the collector as a moderate-sized tree, strictly cauliflorous, with white flowers, in a forest on calcareous soil.

The genus *Brownea* Jacq. contains more than 25 known species, principally from Venezuela, Colombia, and Peru, with more from Venezuela than any other country. Some species occur also in Panama, the Guianas, and Brazil. Many of these are of restricted distribution. Only one new species, *B. herthae* Harms, has heretofore been described from Ecuador. In addition to that species, this collection contains



FIG. 5.—*Brownea angustiflora*, $\frac{1}{3} \times$; flowers, about $\frac{3}{4} \times$.
 4X. FIG. 7.—*Heisteria cyathiformis*, $\frac{1}{3} \times$.

FIG. 6.—*Tetragastris varians*. $\frac{1}{3} \times$; flower,
 FIG. 8.—*Brownea puberula*, $\frac{1}{3} \times$.

three new species of *Brownea*. Most species of *Brownea* have very showy, brilliant red flowers borne in terminal inflorescences. Very few species have white flowers and very few have cauliflory. *Brownea disepala* is odd in both ways in having white flowers borne in clusters on the trunks.

The segregate genus *Browneopsis* Huber (Bol. Mus. Goeldi 4: 565. 1906) was proposed for the species with sheath absent, larger number of stamens, and lesser development of petals (lacking, rudimentary, or 4). However, Ducke, Record and Hess, and Macbride have reduced the segregate to synonymy. Besides *Brownea disepala*, other species in this group are: *Brownea ucayalina* (Huber) Ducke, *Brownea cauliflora* Poepp. & Endl., *Brownea excelsa* (Pittier) Macbr., and *Brownea peruviana* Macbr. Of these, the new species is like the last in its calyx. Macbride (Field Mus. Bot. 13, pt. 3, no. 1: 134-135, 132. 1943) in the original description noted that *B. peruviana* was aberrant in having 4 petals and 2 colored, petaloid bractlets or sepals. After examining a specimen of one of the two collections cited by Macbride (*Klug 3810*), I interpret as sepals the two parallel nerved structures of both species attached in the usual position of the calyx, at the summit of the hypanthium and outside the four clawed, pinnately nerved petals. These sepals, which in both species are slightly 2-toothed or 2-lobed at the apex, may represent a reduction from 4 sepals to 2 connate ones. This interpretation is simpler than the alternate one also mentioned by Macbride of regarding the petals as absent, the 4 clawed petaloid structures as bractlets. In *Brownea* the bractlets or sheath, when present, are attached at the base of the hypanthium, not at the summit.

***Brownea puberula* Little, sp. nov.**

Fig. 8

Arbor 6 m alta vel major, trunco 10 cm diametro. Ramuli, petioli, rhaches, et petioluli dense et minute fusco-puberuli vel demum glabrati. Folia paripinnata; petioli basi crassi, 5-40 mm longi; rhaches (3) 7-25 cm longae; petioluli 3-7 mm longi; foliolae (1) 3-7-jugae, oppositae, oblongo-ellipticae vel ovatae, (4) 7-12 cm longae, (2) 3-6 cm latae, basi inaequales, obtusae vel rotundatae, apice longe caudato-acuminatae (1.5-2.5 cm longa), cori-

aceae, supra glabrae, subtus minute puberulae, reticulatae, costae basi glande uno gerentes. Inflorescentiae terminales vel laterales, interdum ex rhachibus inflorescentiarum priorum; racemi breves, umbelliformes, rhache 2 cm longa, bracteis caducis; flores 15-25, rubri vel coccinei, spectabiles; pedicelli tenues, puberuli, 10-20 mm longi; vagina petaloidea tubulosa, bilabiata, 30-32 mm longa, externe appresso-puberula, intus glabra, lobis acutis 10-12 mm longis; hypanthium anguste tubulosum, 12-14 mm longum, 3 mm diametro, puberulentum vel glabratum; sepala 4, petaloidea, glabra, 24-27 mm longa, anterius obovatum, acutum, 8-11 mm latum, alia oblanceolata, obtusa, 4-6 mm lata; petala 5, fere aequalia, 37-46 mm longa, 9-13 mm lata, longe angustequae unguiculata, glabra, obovata, obtusa; stamina 11, 38-45 mm longa, ad $\frac{1}{2}$ vel $\frac{3}{4}$ longitudinis connata; vagina staminalis externe glabra, intus basi pilosa; filamentis glabris, 10-18 mm longis; antheris 2 mm longis; ovarium 7-8 mm longum, dense tomentosum; stylus tenuis, deorsum tomentosus, 27-35 mm longus; stigma capitellatum. Legumen 20 cm longum, 4.5 cm latum, planocompressum, minute fusco-tomentosum, valvis post dehiscenciam tortuosis.

Tree 6 m tall and 10 cm in trunk diameter. Uncommon in understory of wet, swampy tropical forests at sea level, including flood plain at edge of river and higher level of mangrove swamp forest at San Lorenzo.

ESMERALDAS: San Lorenzo, sea level, April 22, 1943, *Little 6338* (Forest Service no. 98230; U. S. Nat. Herb. no. 1909574, TYPE); April 22, 1943, *Little 6338A* (Forest Service no. 98231); April 19, 1943, *Little 6291* (Forest Service no. 96719). PROVINCE NOT KNOWN: Moist forest at foot of Western Cordillera, altitude 200 m, *Rimbach 183* (U. S. Nat. Herb.).

Rimbach 183, from an inland locality, was described by the collector as a tree 20 m high and 25 cm in trunk diameter, with red flowers in dense umbels, mostly from old wood, sometimes near base of trunk, and more rarely from the branches.

This species is unusual in the dense, minute, dark brown pubescence of the young branches, petioles, rachises, and petiolules. However, in age the pubescence may be nearly absent. The inflorescences are fewer flowered and the flowers more nearly glabrous than in most species of *Brownea*. Though it has the bilabiate floral

sheath found in most species of the genus, *Brownea puberula* is distinct in the size, shape, and pubescence of the floral parts. It resembles *B. birschellii* Hook. f., of Venezuela, which is glabrous and has much larger clusters of larger flowers. In publishing that species, J. D. Hooker (Bot. Mag. 98: pl. 5998. 1872) mentioned that "it closely resembles a species from the Pacific sea-coast of New Granada, at Esmeraldas, collected by Colonel Hall, and preserved in the Hookerian Herbarium." Hall's specimen, collected near the type locality of *B. puberula*, upon examination may prove to be a much earlier collection of this species.

***Brownea angustiflora* Little, sp. nov.**

Fig. 5

Arbor parva 10 m alta, trunco 15 cm diametro. Ramuli glabri. Folia paripinnata, glabra; petioli basi crassi, 4–25 mm longi; rhaches 3–15 cm longae; petioluli 3–5 mm longi; foliolae 2–vel 3-jugae, oppositae, oblongo-ellipticae, (7) 10–23 cm longae, (3) 4–7 cm latae, basi inaequales, obtusae vel acutae, apice caudatoacuminatae (1–3 cm longo), coriaceae, reticulatae, costae basi glande uno gerentes. Inflorescentiae terminales et laterales vel caulines; racemi breves, umbelliformes, rhache 1.5–2 cm longa, bracteis caducis; flores ca. 15–20, rubrae vel coccineae, spectabiles; pedicelli tenues, puberuli, 9–12 mm longi; vagina petaloidea, anguste tubulosa, 35–52 mm longa, 6 mm diametro, uno latere ad 15–20 mm fissa, externe puberula, intus glabra; hypanthium anguste tubulosum, 11–15 mm longum, 2–2.5 mm diametro, glabrum; sepala 4, petaloidea, glabra, anterius oblanceolatum, acutum, 35 mm longum et 6–7 mm latum, alia linearia, acuta, 28–30 mm longa et 2–3 mm lata; petala 5, longe angusteque unguiculata, glabra, maximum oblanceolatum, retusum vel apiculatum, 42 mm longum, 6–8 mm latum, duo oblanceolata, retusa, 35–38 mm longa, 4–6 mm lata, duo linearia, obtusa, 20–22 mm longa, 1–2 mm lata; vagina staminalis 25–29 mm longa, glabra vel leviter pilosa; stamina 9 vel 10, filamentis 10–20 mm longis, antheris 2 mm longis; ovarium 9–10 mm longum, 2 mm latum, dense tomentosum; stylus tenuis, inferne tomentosus, 35–40 mm longus; stigma capitellatum. Legumen paucum, 20 cm longum, 4 cm latum, plano-compressum, minute puberulum; valvis post

dehiscenciam tortuosis; semina orbiculata, plana, 2.5 cm diametro.

Small tree 10 m tall and 15 cm in trunk diameter, in understory of wet tropical forest and in clearing. "Flor de mayo."

ESMERALDAS: Borbón, elevation 15 m, May 3, 1943, *Little 6418* (Forest Service no. 98232; U. S. Nat. Herb. no. 1879851, TYPE); April 26, 1943, *Little 6382* (Forest Service no. 98225).

Two collections of this species were made, both at the same locality. In the type collection, *Little 6418*, the inflorescences are terminal or lateral on the leafy branches. *Little 6382* has the flowers borne on the trunk and slightly larger and more mature.

This species is characterized by long, narrow, slender, nearly glabrous flowers in few flowered clusters. The narrowly tubular flower sheath, which is cleft on one side, is unusually long, 35–52 mm long, and nearly encloses the perianth, though the three larger petals are exerted. The sheath generally varies from 12 to 32 mm long in other species of *Brownea*. Only a few others, such as *B. coccinea* Jacq. and *B. aroensis* Pittier, have the sheath cleft on only one side instead of bilabiate.

***Humiria procera* Little, sp. nov.**

Fig. 12

Arbor magna recta, 30–34 m alta vel major. Ramuli glabri, 4-alati ex foliis et costis decurrentibus, alis 1–2 mm latis. Folia disticha, decurrentia, sessilia, coriacea, vivo atroviridia, nitida, late elliptica, 8–13 cm longa et 5–7 cm lata, basi obtusa, apice abrupte et breviter acuminata (5–10 mm), margine remote glanduloso-crenulata, supra glabra, subtus minute rugulosa, costa subtus carinata, carina angusta, basi 1 mm alta, decurrente. Inflorescentia axillaris, corymbosa multiflora, 4–6 cm longa et 3–5 cm lata, puberula, ca. 5 vel 6 dichotoma vel trichotoma; bractee triangulares, acutae, 1–2 mm longae; pedunculus alatus anceps, 2–2.5 cm longus; pedicelli 1 mm longi; flores minuti, viriduli, ca. 2 mm longi et 1.5 mm lati; sepala 5, rotundata, ciliata, leviter puberula, 1 mm longa; petala 5, oblonga, externe leviter puberula, 1.5–2 mm longa et 0.5 mm. lata; stamina 20, glabra, ca. 1.5 mm longa; filamenta basi connata; cupula hypogyna e squamis plus minus connatis composita; pistillum ca. 1.5 mm longum; ovarium ovoideum, parce puberulum, 5-loculare, ovulis 2 in loculo;

stylus crassus; stigma 5-radiatum. Drupa ovoidea vel ellipsoidea, base obtusa, apice acuta vel obtusa, tomentosa, 25-35 mm longa, 17-20 mm lata; endocarpium osseum, sub apice 5-foveolatum.

Large erect tree of forest canopy in wet tropical forest, 30 to 34 m tall and 40 cm in diameter, according to measurements from trees felled for wood samples, but becoming larger. The fruits resemble pecans (*Carya illinoensis* (Wangenh.) K. Koch) in size and shape. It is said that the oily seeds are edible. "Chanul."

ESMERALDAS: Playa de Oro, altitude about 65 m, May 1, 1943, *Little 6412* (Forest Service no. 95906; U. S. Nat. Herb. no. 1876214, TYPE; with wood sample). *Little 6413* (Forest Service no. 95907; with wood sample). San Lorenzo, altitude about 10 m, April 21, 1943, *Little 6320* (Forest Service no. 96880; with wood sample). Quinindé, altitude 65 m, April 9, 1943, *Little 6233* (old fruits only).

Common and probably widely distributed in the wet tropical forest of Esmeraldas. In some locations near San Lorenzo it comprises a large part of the big timber. Very common also along the banks of Río Santiago above Selva Alegre, where Chanuzal, a group of houses, apparently derives its name from the many trees of "chanul." After partial cutting of other tree species, "chanul" occurs in nearly pure stands. It exists in quantities along the main rivers and trails.

The South American genus *Humiria* Jaume St.-Hil. is distributed in Brazil, the Guianas, Venezuela, and Colombia and apparently has not been reported previously from Ecuador. Though the characteristic size is that of shrubs and small trees, two species are described as becoming large trees under favorable conditions. Selling (Svensk Bot. Tidskr. 39: 257-269, illus. 1945) distinguished 6 living species and 3 fossil ones. The latter, based upon fruits from Brazil, Colombia, and Peru (Piura), indicated a broader distribution of the genus in the Tertiary than at present.

Wood samples of the Ecuadorian material were first determined by S. J. Record as *Humiria* sp. near *H. floribunda* Mart., which occurs in the Guianas, Amazonian Brazil, Venezuela, and Colombia. Subsequent study of herbarium specimens confirmed this determination and showed that an undescribed spe-

cies was represented. *Humiria procera* is readily separated from other species of the genus by the numerous minute flowers only about 2 mm long, while the others have fewer, larger flowers usually about 4-5 mm long. In *H. procera* the twigs are prominently 4-winged and the leaves are distichous, abruptly acuminate, and crenulate, while in *H. floribunda* the twigs are only slightly winged, the leaves spirally arranged, smaller, usually obtuse at apex, and entire or nearly so. The distichous leaves distinguish *H. procera* from most species of the genus also.

The following notes on the wood of *Humiria procera* were made by J. Edson Myer, of the Forest Service field party. Sapwood grayish white, about 5 cm thick. Heartwood dull red, becoming brownish on exposure, hard and heavy, having a specific gravity of 0.68 based upon volume when green or 0.82 based upon volume when oven dry. Texture fine and uniform. Growth rings are indistinct due to fewer pores in denser zones; the pores are minute, thin walled, and numerous. The rays are very fine, not visible on cross section and low and inconspicuous on radial section. Wood fairly difficult to cut, rather harsh, readily polished, strong but brittle, and of medium durability. Not used much because of alleged silica content which dulls saws. Might be used for construction where not exposed to the weather.

Waterman (Trop. Woods 88: 1-11. 1946 (1947)) included wood samples of the collections cited above in tests of decay resistance of water-soluble extractives of several tropical American woods to growth of wood-decay fungi. This species, listed as *Humiria* sp., was found to be nontoxic or not resistant to decay.

Erythrochiton carinatus Little, sp. nov.

Fig. 14

Sect. *Toxosiphon* (Baill.) Engl. Frutex vel arbor parva 2-5 m alta, trunco 5 cm diametro. Cortex griseus, leviter asper et fissilis, decorticans. Folia solitaria, unifoliata; petioli (2) 4.5-7 cm longi, 1.5 mm diametro, glabri, tenues, semiteretes, apice tumido-articulati; laminae oblongo-ellipticae, 11-20 cm longae et 5-8 cm latae, basi cuneatae, apice abrupte acuminatae, integrae, papyraceae, glabrae, inconspicue glanduloso-punctatae, venis lateralibus primariis ca. 12-14, angulo obtuso egredientibus, arcuatis, venulis reticulatis. Inflores-

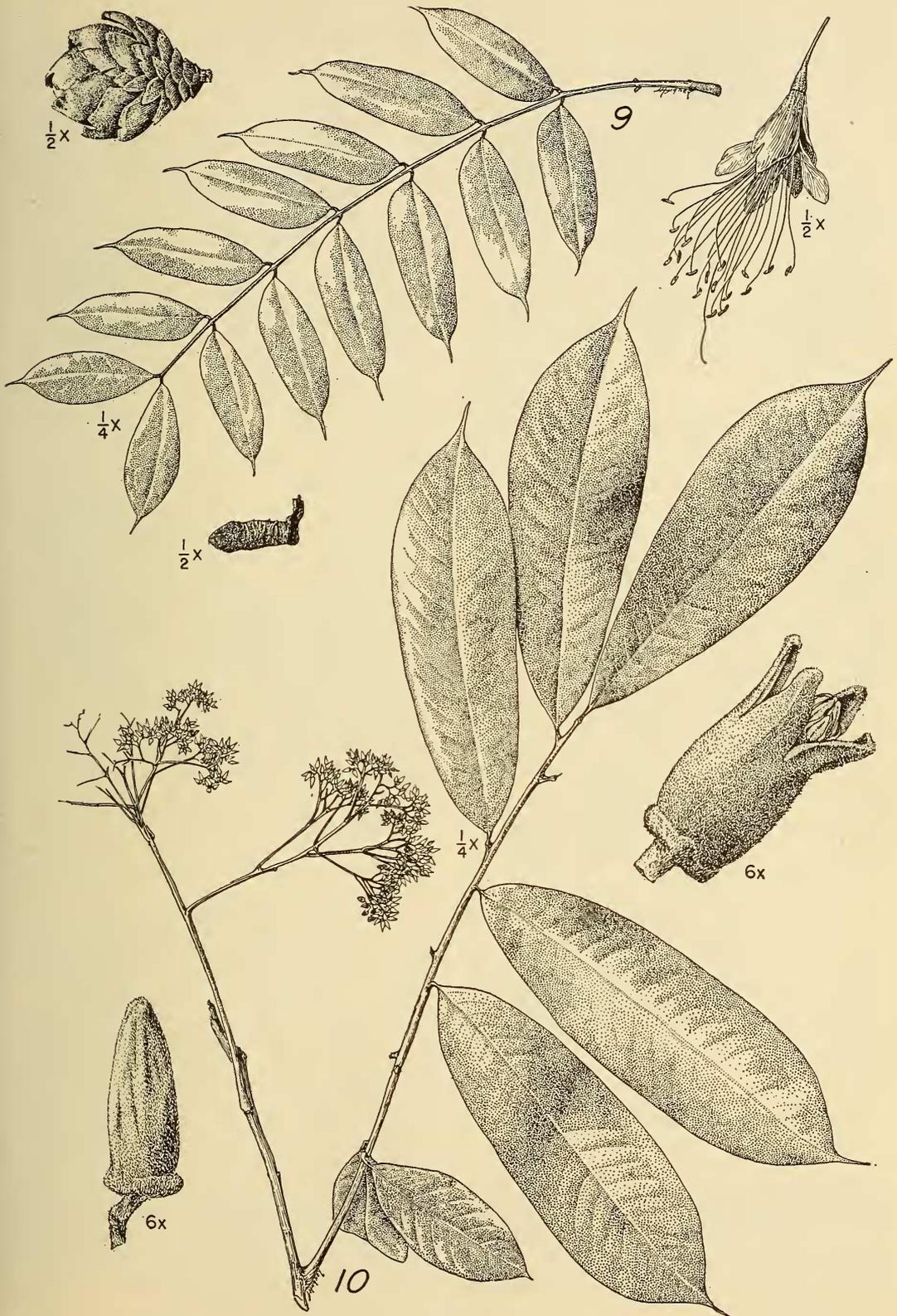


FIG. 9.—*Brownea disepala*, $\frac{1}{4} \times$; axis of old inflorescence, $\frac{1}{2} \times$; young globose, unopened inflorescence, $\frac{1}{2} \times$; flower, $\frac{1}{2} \times$. FIG. 10.—*Trichilia floribunda*, $\frac{1}{4} \times$; bud, $6 \times$; flower, $6 \times$.

centia terminalis, 17–19 cm longa, longepedunculata; pedunculus 11–15 cm longus, sulcatus, strigillosus, apice furcatus, ca. 3-florus; flores desunt. Sepala libera, persistentia, bractei-formia, viridia, lanceolata, acuminata, reticulata, inconspicue glanduloso-punctata, externe fere glabra, intus dense tomentulosa, in fructu 30–37 mm longa et 4–8 mm lata, capsulis subduplo longiora; capsula fere ad medium 5-lobata, pallide viridis, 15 mm alta et ca. 20 mm lata, coccis 5, reticulatis, inconspicue glanduloso-punctatis, puberulis, ca. 15 mm altis et 9 mm latis, carina prominente 1–2 mm lata, mucrone 1 mm longo; semina 2, superposita, fusca, fere laeve, 5 mm longa et 4 mm lata et crassa.

Shrub or small tree 2 to 5 m tall and 5 cm in diameter. Bark gray, slightly rough and fissured, shredding. Common locally in understory of mountain (wet tropical) forest. "Chumi."

EL ORO: Piedras, altitude about 500 m, June 18, 1943, *Little 6632* (Forest Service no. 98509; U. S. Nat. Herb. no. 1909573, TYPE).

The genus *Erythrochiton* Nees & Mart. contains seven previously described species of shrubs or small trees widely but sparingly distributed in tropical America from southern Mexico to Colombia, Brazil, and Peru. Engler (in Engler and Prantl, *Natürl. Pflanzenfam.* ed. 2, 19a: 288. 1931) listed five species, and two others have been added. Apparently this genus has not heretofore been reported from Ecuador. Specimens of both *Erythrochiton brasiliensis* Nees & Mart. and this new species were collected near Piedras, El Oro.

Erythrochiton carinatus belongs to Section *Toxosiphon* (Baill.) Engl., in which the 5 sepals are free, and is distinguished in fruit from the other four species of this section by the elongate, acuminate sepals about twice the length of the capsule and by the deeply lobed capsule, with a prominent keel on each segment.

Tetragastris varians Little, sp. nov.

Fig. 6

Arbor 25 m alta, trunco 50 cm diametro. Ramuli crassi, subteretes, brunnescentes, glabri, lenticellis elevatis. Folia alterna, pinnata, apicem ramulorum versus trifoliolata vel unifoliolata, petioli 4–9 (21) cm. longi, evidenter

sulcati, subancipites, glabri, supra plani; rhachis foliorum trifoliolorum 2–4 cm longae, sulcatae, glabrae, supra planae; petioli 2–4 mm longi; laminae foliolarum late ellipticae ad obovatae, 9–20 cm longae et 5–10 cm latae, basi obtusae vel cuneatae, apice abrupte acuminatae (5–10 mm), chartaceae, integrae, venis primariis utrinque latere ca. 9–12, angulo lato divergentibus, arcuatis et prope marginem anastomosantibus, utrinque venis et venulis elevatis et prominente reticulatis, supra glabrae, subtus glabratae, minute papillo-sae, ad costam pilis paucissimis appressis praeditae. Paniculae laterales apicem ramulorum versus, 7–12 cm longae, multiflorae: rhachis leviter compressae, minute strigillo-sae, bracteatae; bracteae triangulares, acutae, 1 mm longae; pedicelli 0.5–1 mm longi; flores 4-meri (raro 5-meri), 4.5–5 mm longi; calyx 2.5 mm longus et 3 mm latus, glaber, lobis 3 vel 4, triangularibus, acutiuseculis, 1–1.5 mm longis, corolla anguste campanulata, 4.5–5 mm longa, externe minute strigillosa, intus glabra, ad medium in lobis 4 (raro 5) divisa, lobis lanceolatis, 2.5 mm longis et 1 mm latis, acutis, valvatis, carinatis, crassis, marginibus apiculoque inflexis; stamina 8 (raro 10), sub disco inserta, 1.5 mm longa, glabra, antheribus 1 mm longis; discus annularis, 0.7 mm longus, 2 mm diametro, glaber, margine crenatus; ovarium ovoideum, 1.5 mm longum et 1.3 mm diametro, sparse pilosum, 4-loculare (raro 5-loculare) ovulis in loculis 2; stylus brevis; stigma capitatum, 4-lobulatum (raro 5-lobulatum). Fructus deest.

Large tree 25 m tall and 50 cm in trunk diameter, in wet tropical forest. Wood used for lumber. "Quemapecho."

ESMERALDAS: San Lorenzo, altitude about 10 m, April 20, 1943, *Little 6292* (Forest Service no. 96876; U. S. Nat. Herb. no. 1877653, TYPE).

Six species of *Tetragastris* Gaertn. are recognized in the recent monograph by Swart (*Rec. Trav. Bot. Neerland.* 39: 403–419, illus. 1942), and another was published in 1939. This generic name is retained here over the technically valid, older generic name *Hedwigia* Sw. (1788), which is not in use. *Hedwigia* [Ehrh. 1781] Beauv. (1805) should be made a *nomen conservandum* for a monotypic genus of mosses (LITTLE, *Bryologist* 46: 114–115. 1943). The genus is distributed from Brazil and British Guiana to the West Indies and Central America and now

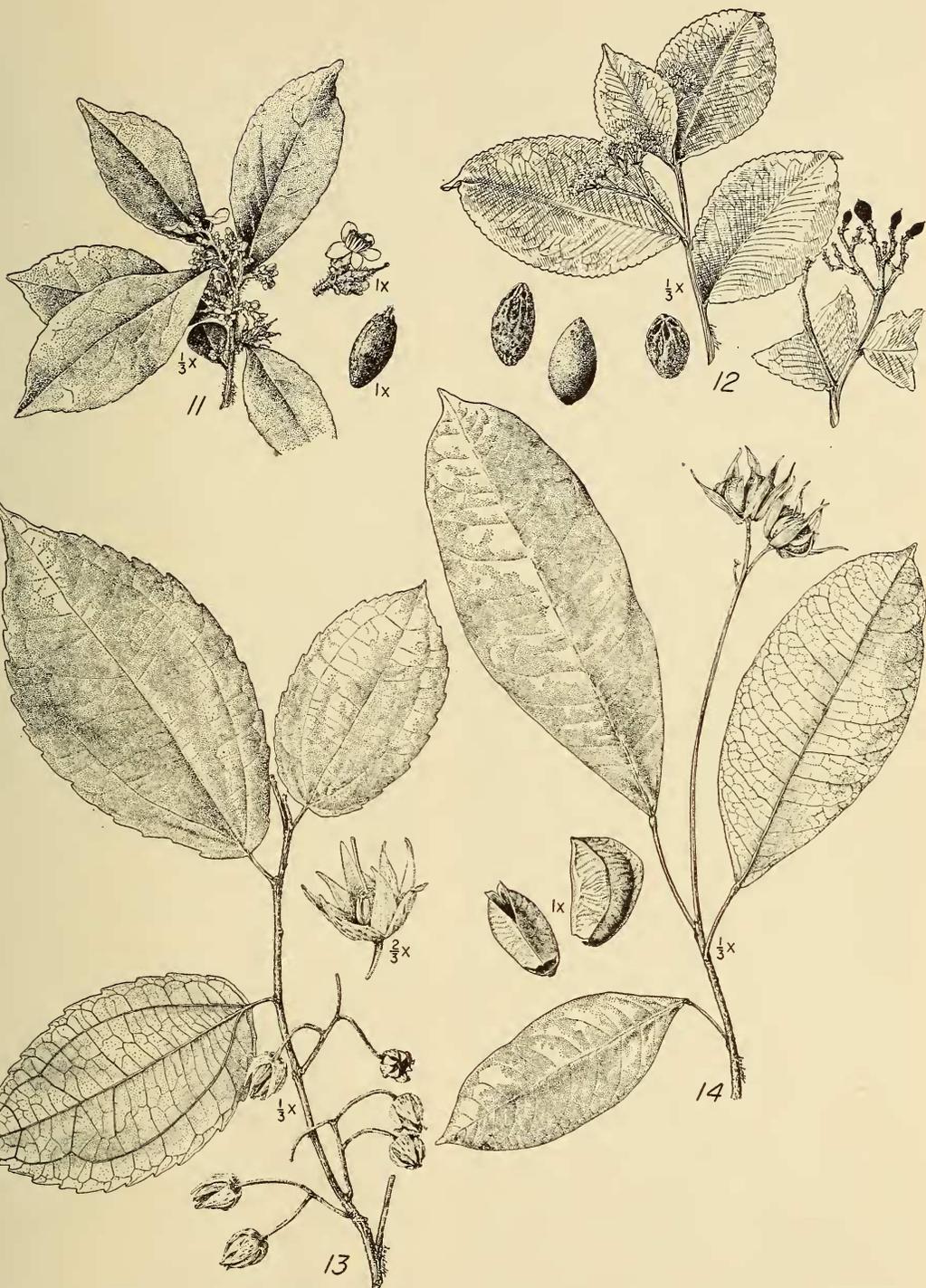


FIG. 11.—*Symplocos ecuadorensis*, $\frac{1}{3}\times$; flowers, $1\times$; fruit, $1\times$. FIG. 12.—*Humiria procera*, including fruit and two old fruits showing bony endocarp, all $\frac{1}{3}\times$. FIG. 13.—*Neosprucea pedicellata*, $\frac{1}{3}\times$; flower $\frac{2}{3}\times$. FIG. 14.—*Erythrochiton carinatus*, $\frac{1}{3}\times$; carpels of fruit, $1\times$.

is reported for the first time from Ecuador and the Pacific slope of South America.

Tetragastris varians is easily distinguished by the broadly elliptic leaflets, which vary in number. Leaves at the ends of twigs have only 3 leaflets or 1, but apparently some leaves have more leaflets. Other species of the genus have narrower leaflets, 5 (rarely 3) to 11 in number. In the new species the calyx is glabrous, the corolla is minutely strigillose outside and glabrous inside, and the ovary is sparsely pilose. Specimens of the type collection in the U. S. National Herbarium and Forest Service Herbarium are terminal portions of twigs with both trifoliolate and unifoliolate leaves. However, the type bears, at a distance of 30 cm from the apex of the twig, the base of a much longer pinnate leaf with petiole 21 cm long and with a single leaflet attached.

***Guarea polymera* Little, sp. nov.**

Fig. 4

Sect. *Euguarea* C. DC. Arbor 12 m alta, myrmecophila, trunco 15 cm diametro. Ramuli minute et dense brunneo-glanduloso-tomentulosi. Folia pinnata; petioli 6-7 cm longi, supra canaliculati; rhaches ca. 26 cm longi; foliolae 6- vel 7-jugae, breviter (4-5 mm) petiolulatae; laminae oblongo-lanceolatae, base acutae, apice acuminatae, membranaceae, 20-23 cm longae, 6-7 cm latae, supra glabrae, subtus inconspicue et minute cinereo-puberulae, nervis lateralibus utrinque 12-15, ascendentibus et margine curvatis, his cum costa supra fere planibus, subtus prominentibus. Paniculae axillares 6-12 cm longae, 3-6 cm latae, ramulis minute glanduloso-tomentulosis, bractee triangulares, acutae, 2-3 mm longae; pedicelli clavellati 5-15 cm longi. Flores albi, fragrantis, (5) 6- vel 7-meri, calyx late cupulatus, 3 mm longus, 7 mm latus, leviter 10-16-lobatus, lobulis 0.5 mm longis, mox 3-4-fissus fere ad basin, externe brunneo-tomentulosis, intus glaber. Petala 5-7, valvata, lanceolata, acuta, leviter involuta, 10 mm longa, 3 mm lata, externe dense albido-sericeo-tomentulosa, intus glabra; tubus stamineus cylindricus, margine crenulatus, 7 mm longus, 4 mm diametro, glaber; antherae 10-14, inclusae, sub margine sessiles, 1.5 mm longae; gynophorum 1 mm altum, glabrum, apice annulum glandulosum gerens, 4 mm diametro; ovarium ovoideum,

sulcatum, dense sericeo-tomentulosum, 3 mm longum, 2.5 mm diametro, 6-8-loculare, loculis 2-ovulatis, ovulis superpositis; stylus crassus, strigillosus, 3 mm longus, 1 mm diametro; stigma crassum discoideum, glabrum, 2 mm diametro. Capsula fere matura globosa, rugulosa, brunnea, 11 mm diametro, 6-8-loculare; semina in loculo 2 superposita, atra, ca. 3 mm longa.

Tree 12 m tall and 15 cm in diameter, said to become larger. Twigs hollow and inhabited by ants. Wet tropical forest. "Pialde macho."

ESMERALDAS: Playa de Oro, altitude 65 m, April 30, 1943, *Little 6404* (Forest Service no. 98254; U. S. Nat. Herb. no. 1877588, TYPE; with wood sample).

This specimen is readily associated with the group of a few species in the large genus *Guarea* Allem. ex L. and Sect. *Euguarea* C. DC. having ovaries and capsules with more than 5 cells (6 to 12). The flowers are 6- or 7-merous, rarely 5-merous, and the ovaries are 6-8-celled. Petals are 5 to 7, instead of the usual number in this genus, 4 or 5. The wood sample was identified by S. J. Record as *Guarea*. Other species with approximately the same number of carpels are *G. purusana* C. DC., of Amazonian Brazil, with 6-9-celled ovary but much larger fruit and dense brownish pubescence, and *G. grandifolia* DC., of Guiana, 7-celled but otherwise 4-merous. This Ecuadoran collection contains also specimens of *G. syringoides* C. H. Wright (?) and *G. trichiloides* L.

Perhaps *Guarea* Allem. ex L. (Mant. Pl. 2: 150. 1771) should be made a *nomen conservandum* over *Elutheria* P. Br. (Civ. Nat. Hist. Jamaica 369. 1756). The latter was referred to *Guarea* by Fawcett and Rendle (Fl. Jam. 4: 215. 1920) and cited by Harms (in Engler and Prantl, Natürl. Pflanzenfam. ed. 2, 1961: 129. 1940). Rendle (Journ. Bot. 50: 129. 1912) contended that it was unnecessary to conserve names against earlier names by Patrick Browne observing that Browne published descriptions of species only, not genera. Whether Browne's descriptions in monotypic genera, such as *Elutheria*, would be valid as combined generic and specific descriptions (art. 43) is uncertain because binomial nomenclature was not adopted. Nevertheless, several generic names of Browne having priority have formally been made *nomina rejicienda*.

Trichilia floribunda Little, sp. nov.

Fig. 10

Sect. *Moschoxylum* (A. Juss.) C. DC. Arbor 10–20 m alta vel major, trunco 20 cm diametro. Ramuli minute strigillosi. Folia alterna, magna, imparipinnata; petioli 8–11 cm longi; rhaches 30–35 cm longae; foliolae 11–14, alternae; petioluli 5–12 mm longi; petioli, rhaches, et petioluli minute strigillosi; laminae foliolarum oblanceolatae, (11) 25–33 cm longae et (5) 7–10 cm latae, infimae minores, basi acutae, apice acutae, integrae, subcoriaceae, supra glabrescentes, subtus minute et sparse puberulentae vel glabrescentes, nervis lateralibus utrinque (9) 20–25, ascendentibus, marginem versus curvatis, his cum costa supra fere planibus vel leviter impressis, subtus prominentibus. Paniculae axillares, corymbiformes, multiflorae, 20–30 cm longae, fere 20 cm latae, ramulis strigillosis; pedicelli tenues, 1–2 mm longi; flores flavo-albidi, fragrantis; alabastrum oblongo-ovoideum, 6 mm. longum et 2–2.5 mm latum; calyx patelliformis, brevissimus, subinteger vel leviter 4- vel 5-lobulatus, 0.5 mm longus et 2.5 mm latus, externe strigillosus, intus glaber; corolla in alabastro 6 mm longa et 2–2.5 mm diametro, externe dense cinereo-strigillosa, intus glabra; tubus cylindricus, 4-lobatus (raro 3-lobatus) fere ad medium, lobis lanceolatis, obtusis, cucullatis, valvatis, leviter involutis; tubus stamineus urceolatus, 4 mm. longus, apice 6–8 denticulatus (denticulis 1 mm longis), externe glabrescens vel parce appresso-pilosus, intus hirtellus; antherae 6–8, vulgo 7, inter denticulos insertae, exsertae, 1 mm longae; ovarium ovoideum, cum gynophoro 1.5 mm longum et 1 mm latum, dense strigillosum, 2- vel 3-loculare, loculis 2-ovulatis; stylus tenuis, inferne strigillosus, 1.5 mm longus; stigma clavatum. Fructus deest.

Tree 10–20 m tall and 20 cm in diameter, reported to become a large tree of forest canopy. Wood said to be used for axe handles. Possibly of ornamental value because of the abundant small, yellowish-white, fragrant flowers. Wet tropical forest of northwestern Esmeraldas. "Pialde."

ESMERALDAS: San Lorenzo, altitude 10 m, April 21, 1943, *Little 6323* (Forest Service no. 96852; U. S. Nat. Herb. no. 1877646, TYPE); Borbón, altitude 15 m, April 26, 1943, *Little 6372* (Forest Service no. 98283; with wood sample).

The very numerous flowers in this species of *Trichilia* P. Br. have a saucerlike calyx very slightly 4- or 5-lobed, and the 4-lobed corolla united more than half its length. This species has relatively large leaves and leaflets for the genus. S. J. Record named the wood sample as *Trichilia*. Also represented in this collection are *T. hirta* L and *T. macrophylla* Benth.

Belotia australis Little, sp. nov.

Fig. 1

Arbor 18 m alta vel major; trunco 35 cm. diametro. Cortex glaber, albidus. Ramuli et petioli minute dense stellato-puberuli, grisei. Petioli 8–15 mm longi. Laminae ellipticae vel lanceolatae, 9–14 cm longae, 3–6 cm latae, basi obtusae vel acutae, apice acuminatae, acumine 1–1.5 cm longo, glanduloso-serrulatae, 3-nervatae, chartaceae, discolores, supra virides, minute sparse stellato-puberulae, subtus griseae, minute dense stellato-puberulae, pilis paucis stellatis majoribus praeditae. Inflorescentia cymosa axillaris, 3–6 cm longa, ca. 10-flora; pedicelli 3–6 mm longi; bractee lanceolatae, 2–4 mm longae, interdum 2- vel 3-dentatae; pedunculus et pedicelli bracteeaque minute dense stellato-puberulae, griseae; alabastra ca. 8 mm longa; flores 10–11 mm longi; sepala 5, rubella, lanceolata, 9–11 mm longa, 2.5 mm lata, margine involuta, apice obtusa, cucullata, 5-nervata, externe minute dense stellato-puberula, intus fere glabra, pilis paucis stellatis praedita; petala 5, ligulata, 8–9 mm longa, 1.5 mm lata, apice 2–4-dentata, 5-nervata, externe sparse pubescentia, intus basi et circum nectarium stellato-pilosa, ceterum glabra; androgynophorum 1 mm altum, apice discum dense stellato-pilosum 3 mm diametro ferens; stamina 15, 2–3 mm longa; filamenta deorsum stellato-pilosa; antherae suborbiculares, 0.3 mm longae; ovarium ovoideum, 3 mm longum, 2.5 mm diametro, dense pilosum, 2-loculare, ovulis paucis; stylus 3–4 mm longus, basi stellato-pilosus; stigma 4-lobatum, lobis laciniatis, 0.5 mm longis. Capsula bilocularis, valde obcompressa, loculicida, brunnea, 15 mm longa, 20 mm lata, 4 mm crassa, basi rotundata, apice truncata, sparse puberula, pilis minutis stellatis et pilis stellatis multo longioribus interspersis, stylo persistente cuspidato 3 mm. longo coronata. Semina desunt.

Tree 18 m tall or larger, and 35 cm in diame-

ter. Bark smooth, whitish. The light-weight wood is sometimes mixed with that of balsa (*Ochroma lagopus* Sw.) and substituted for the latter. Scattered in cutover wet tropical forest and fields at San Lorenzo but not common. "Chillarde." Also improperly called "balsa."

ESMERALDAS: San Lorenzo, altitude about 10 m, April 19, 1943, *Little 6273* (Forest Service no. 96826; U. S. Nat. Herb. no. 1858843, TYPE; with wood sample).

In the genus *Belotia* A. Rich., T. A. Sprague (Kew Bull. 1921: 270-278. 1921) distinguished 11 species, including 6 new, distributed from southern Mexico through Central America to Panama and in Cuba and Santa Lucia in the West Indies. A. A. Bullock (Kew Bull. 1939: 517-521. 1939) later examined additional material and reduced the number of species to 9. Sprague predicted that this genus might be found later in the Pacific coast forests of Colombia, and this collection represents a further southward extension of *Belotia* to Ecuador.

Belotia australis is related to *B. panamensis* Pittier (*B. macrantha* Sprague) of Panama. Pubescence in the former is finer, more minute, and gray, while the latter has the twigs and branches of inflorescence coarsely ferruginous tomentose. The leaves of *B. panamensis* usually are larger, rounded or obtuse at base, and with teeth more prominent. The under surface of the leaves in *B. australis* has finer pubescence with the larger hairs of the upper tier scattered and fewer. The flowers of *B. panamensis* are slightly larger. Capsules in both species are similar in size and shape, but those of *B. panamensis* are much more densely stellate pubescent and have shorter styles less than 3 mm long.

Sprague noted that the common name "balsa," which is applied to *B. australis*, is used also in British Honduras for *B. campbellii* Sprague.

***Matisia alata* Little, sp nov.**

Fig. 16

Arbor 20 m. alta, trunco 20-30 cm diametro. Ramuli et petioli minute stellato-tomentosi, pilis flavis, radiis numerosis, brevissimis, glandulosis, demum glabrescentes. Folia magna petiolata, petiolis 2-5 cm longis; laminae oblongo-ovatae, 15-38 cm longae, 8-18 cm latae, basi subrotundatae vel leviter cordatae, apice acutae, margine integrae vel obscure un-

dulatae, penninervis, nervis lateralibus 9-12 utrinque latere, prope marginem arcuatis et anastomosantibus, subtus elevatis, venulis prominente reticulatis, supra glabratae, subtus sparse et minute stellato-puberulae. Flores solitarii, oppositifolii, 2 vel 3 apice ramulorum, magni, 7 cm longi; pedicellus crassus, curvatus, fulvus, 4-7 cm longus, 3 mm diametro; calyx anguste campanulatus, 45 mm longus, 22 mm diametro cum alis, basi attenuatus, crassus, plus minusve succulentus, ochraceus, dense et minute stellato-tomentosus, pilis glandulosis, intus dense sericeus, lobis 5 brevibus, acutis, 3-5 mm longis, alis 10, longis, angustis, usque ad 6 mm latis; petala 5, ochracea, 70 mm longa, basi connata tubo 2 mm, limbo spatulato vel obovato, obtuso, ca. 32 mm longo et 15-18 mm lato, externe dense stellato-tomentoso, intus glabro; columna staminea longe exserta, leviter curvata, 5 cm longa, 5-lobata, lobulis leviter pubescentibus, 10-16 mm longis, antherarum loculis 4-6 linearibus; ovarium 5-lobatum, 5-loculare, 3 mm longum, stellato-tomentosum; stylus 60 mm longus, 10 mm exsertus, curvatus, stellato-tomentosus; stigma capitatum, 2 mm longum. Fructus globosus, succulentus, ochraceus, magnus, 8-10 cm diametro, calyce acrescente 6-7 cm longo, cum alis 4-10 mm latis, suffultus.

Tree 20 m tall and 20-30 cm in trunk diameter. It is said that the large, fleshy fruits are edible. Observed also at San Lorenzo, Esmeraldas. Wet tropical forest of Esmeraldas and Pichincha, northwestern Ecuador. "Sapote," "sapotillo."

ESMERALDAS: Quinindé, altitude 65 m, April 12, 1943, *Little 6244* (Forest Service no. 96751; U. S. Nat. Herb. no. 1858828, TYPE). PINCHINCHA: between Santo Domingo de los Colorados and Quinindé, April 7, 1943, *Little 6197* (Forest Service no. 96867); April 8, 1943, *Little 6200* (Forest Service no. 96785; in fruit).

More than 20 species of the genus *Matisia* H. B. K. have been described, a third of these in 1945-1946. This genus of small to medium-sized trees ranges from Brazil to Colombia and Ecuador and north to Panama and Costa Rica. Some of the species apparently are of local range. In this Ecuadorian collection are *M. cordata* Humb. & Bonpl., a cultivated species, *M. coloradum* R. Benoist, an Ecuadorian species found again at the type locality, and two species proposed here as new.

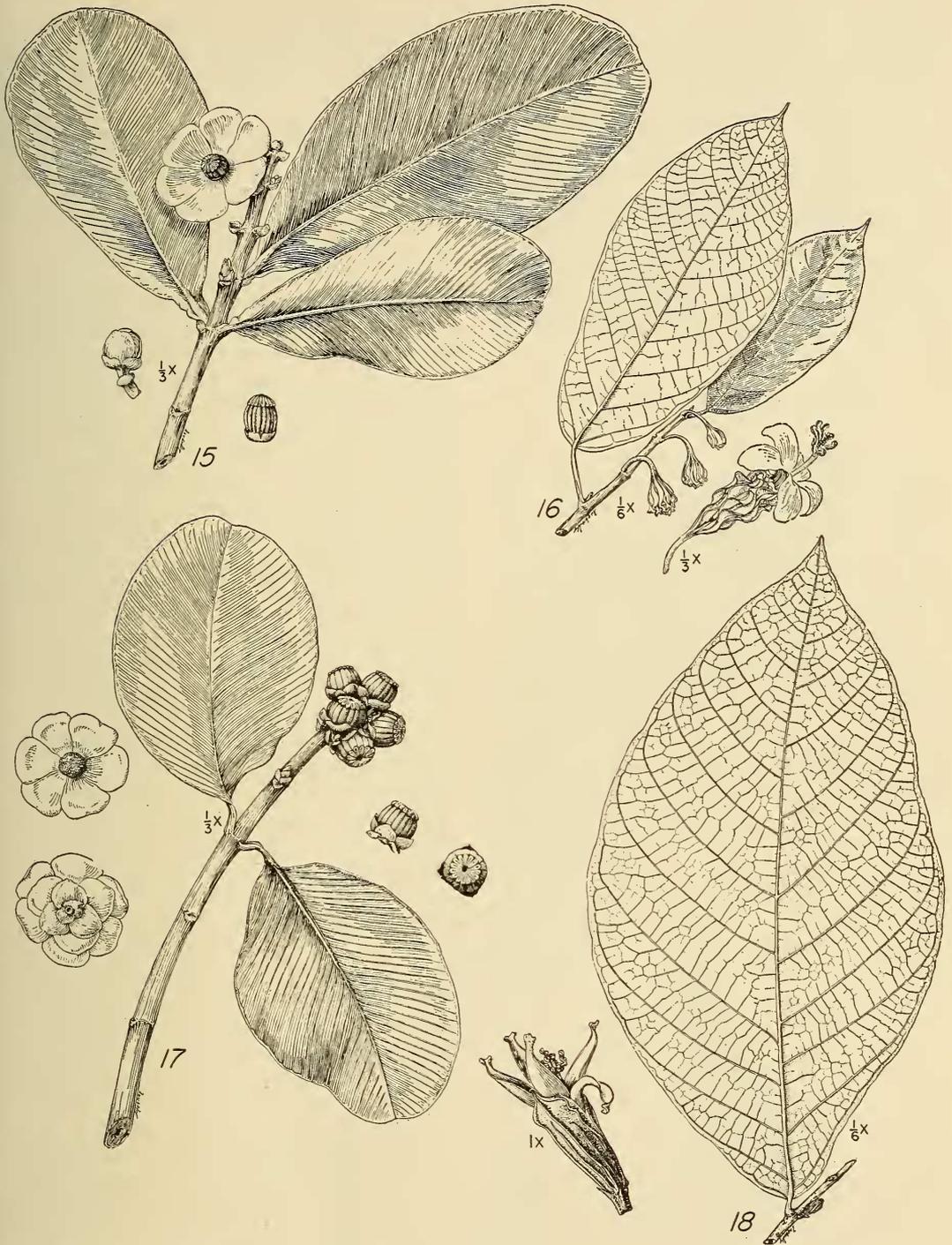


FIG. 15.—*Clusia polystigma*, including bud and immature fruit, all $\frac{1}{3} \times$. FIG. 16.—*Matisia alata*, $\frac{1}{6} \times$; flower, $\frac{1}{3} \times$. FIG. 17.—*Clusia plurivalvis*, including separate staminate flowers and fruits, all $\frac{1}{3} \times$. FIG. 18.—*Matisia grandifolia*, $\frac{1}{6} \times$; flower, about $1 \times$.

Matisia alata, one of the few species with pinnately veined leaves, is distinguished from other species of the genus by the prominent wings on the calyx, to which the specific name refers, and by the large flowers, which are orange or brownish in color. The 10 conspicuous wings of the calyx tube are longitudinal, narrow, slightly curled projecting ridges, starting at the base of the calyx and reaching a maximum width of 6 mm. near their rounded ends of the apex of the calyx. The 5 wings opposite the calyx lobes are larger, while the alternate wings are smaller and shorter or may be almost absent.

***Matisia grandifolia* Little, sp. nov.**

Fig. 18

Arbor parva, 5 m alta, trunco 5 cm diametro. Ramuli et petioli dense et minute stellato-tomentosi, pilis multiradiatis, glandulosis. Folia magna, petiolata, petiolis 1-1.5 cm longis, 4 mm diametro; laminae late ellipticae, 50-60 cm longae, ca. 28 cm latae, basi rotundatae, apice acuminatae, margine integrae vel obscure undulatae, penninervis, nervis lateralibus 12-14 utrinque latere, prope marginem arcuatis et anastomosantibus, subtus elevatis, venulis prominente reticulatis, supra glabrae, subtus minute stellato-puberulae. Flores pauci, solitarii, oppositifolii, 3-3.5 cm longi; pedicellus brevis, leviter curvatus, 5-7 mm longus; bracteis 3, basi floris, subulatis, 3-6 mm longis; calyx anguste campanulatus, fulvus, 22-25 mm longus, 8 mm diametro, uno latere 10-12 mm fissus, lobis plerumque cohaerentibus, saepe 2-4, sinus 2-7 mm longis, alis 10 longis, angustis, 1 mm latis, dense et minute stellato-tomentosus, pilis glandulosis, intus dense sericeus, petala 5, in sicco rubida, anguste oblanceolata, apice obtusa, 30-34 mm longa, 4-5 mm lata, externe apice appresso-stellato-tomentosa; columna staminea 17-20 mm longa, apice leviter pubescens, 4- vel 5-lobata, lobulis 3-9 mm longis, antherarum loculis ellipticis usque ad 8; ovarium conicum, 5-locularis, 3-4 mm longum, stellato-tomentosum; stylus 24 mm longus, 3 mm exsertus, stellato-tomentosus; stigma 5-lobatum, lobulis obtusis, fere 2 mm longis. Fructus deest.

Small tree 5 m tall and 5 cm in diameter, said to become larger. One tree seen in cacao plantation, wet tropical forest area. "Penimón."

PICHINCHA: Santo Domingo de los Colorados, altitude 560 m, April 7, 1943, *Little 6146* (Forest Service no. 96782; U. S. Nat. Herb. no. 1858834, TYPE).

This species is characterized by unusually large, pinnately veined leaves, by the short pedicels, and by the calyx split on one side, with 10 narrow wings or ridges.

***Clusia plurivalvis* Little, sp. nov.**

Fig. 17

Arbor dioica, recta, extensa, 15 m alta, trunco 30 cm diametro. Cortex fuscus, leviter asper, fissus, latices alba. Ramuli crassi, teretes. Folia petiolata; petioli 1.5-4 cm longi, 4-7 mm lati, leviter alati; laminae ovales vel obovatae, (8) 12-24 cm longae, (5) 8-14 cm latae, basi obtusae vel acutae, apice rotundatae, valde coriaceae, nervis lateralibus numerosis, parallelis, sub angulo ca. 60-70° adscendentibus. Inflorescentia terminalis, capitata, pauciflora pedunculo crasso, 2.5-4 cm longo, 6 mm diametro, floribus sessilibus. Flores masculi magni, 5 cm diametro; bractee calycinae rotundae, 4-9 mm longae, 8-13 mm latae, obtusae, carinatae; sepala 4-6, biseriata, late rotundata, obtusa, concava, coriacea, 2 inferiora minora 6-10 mm longa et 15 mm lata, superiora 10-15 mm longa et 12-20 mm lata; petala 5, obovata, 28-32 mm longa, 20-25 mm lata, obtusa, in vivo alba, basi incarnata vel ochracea; stamina in disco convexo 5-6 mm alto et 10-13 mm diametro inserta, numerosissima, spissa, fere sessilia, antheris 1.5 mm longis, longitudinaliter dehiscentibus; staminodia in globo resinoso 5 mm diametro apice disci aggregata. Flores feminei desunt; sepala in fructu persistentia, similia sepalis florum masculorum; staminodia nulla. Capsula succulenta depressoglobosa, 17 mm alta et 21 mm diametro, 13-16-locularis et 13-16-valvatis; stigmata 13-16, peltata, radiata, sessilia, triangularia, plana, 8 mm longa et 2-3 mm lata, atra, in disco 17 mm diametro; semina in loculis 2.

Large, erect, widely spreading tree 15 m tall and 30 cm in trunk diameter. Bark dark brown, slightly rough, with white latex. Common and with another, probably undescribed species of *Clusia* (*Little 6769*) a dominant tree species of the dry mountain forest in ravines at Huigra. Common name "lamai," according to Rose.

CHIMBORAZO: Huigra, altitude 1300 m, July 17, 1943, *Little 6768A* (Forest Service no.

98525; U. S. Nat. Herb. no. 1857089, TYPE; with fruits). *Little 6768* (Forest Service no. 95852; with staminate flowers). *Little 6768B* (Forest Service no. 98526; with staminate flowers). Huigra, Aug. 19, 1918, *J. N. Rose and George Rose 2223* (U. S. Nat. Herb. no. 1021907; with fruits and staminate flowers but also containing larger, detached, sectioned fruits of a different species).

Rose and Rose 2223 bears the note, " 'Not at Kew' N. L. Britton]. Sept. 1920." *Clusia plurivalvis* is not readily placed in the proper section in the latest summary of *Clusia* L. by Engler (Natürl. Pflanzenfam. ed. 2, 42:

199-204. 1925). It seems to be in subgenus *Thysanoclusia* Vesque and related to section *Euclusia* Planch. & Triana, which differs in having the connectives elongate and pointed. In this species the numerous stamens are crowded and almost sessile in a convex disc, which bears a central resinous mass of staminodia. The number of carpels in the ovary in this species, 13-16, is very high. Of the species in which the number of carpels is known, only a few, such as *C. flava* Jacq. with 12-14 carpels, *C. cuneata* Benth. with 16, and the new species described below have more than 12 carpels.



FIG. 19.—*Aspidosperma elatum*, $\frac{1}{2}x$; fruit, $\frac{1}{2}x$.

Clusia polystigma Little, sp. nov.

Fig. 15

Epiphyta magna, scandens, arborea, dioica, 10 m alta, trunco 10 cm diametro. Ramuli crassi, teretes. Folia subsessilia, obovata, 15–20 cm longa, 8–11 cm lata, basi angustata et subpetioliformes, apice obtusae, valde coriaceae, nervis lateralibus numerosis, parallelis, sub angulo ca. 50° adscendentibus. Flores masculi desunt. Inflorescentia feminea terminalis, racemosa, pauciflora, rhache 6 cm longa, bracteata, bracteis oppositis, late ovatis, 5–8 mm longis et 6–10 mm latis; pedicelli 3–6 mm longi; bracteae calycinae 2 late rotundatae, 3 mm longae et 5–6 mm latae, obtusae, crassae; sepala 4–6, biseriata, late rotundata, obtusa, coriacea, minora 2 inferiora, 7–11 mm longa et 9–12 mm lata, 2–4 superiora 15–16 mm longa et 12–18 mm lata; petala 6 vel 7, obovata, 32–34 mm longa et 22–24 mm lata, obtusa, in vivo albida, leviter incarnato-tincta; cupula staminodialis 3–4 mm longa, 12 mm diametro, apice leviter lobata; ovarium cylindricum, 4 mm longum, 6 mm diametro, sulcis longitudinalibus et loculis 16–19, loculis multiovulatis; stigmata 16–19, radiata, sessilia, anguste triangularia, 5–6 mm longa et 1.5 mm lata, atra, connata in annulo 4–5 mm longo et 8–9 mm diametro. Capsula succulenta immatura subglobosa, 18 mm longa et 16 mm diametro, sulcata, stigmatibus sessilibus coronata.

Large woody vine 10 m tall and 10 cm in trunk diameter, epiphytic on a tree of *Ficus* sp. nov. (*Little 6356*) left in a clearing, wet tropical forest. "Matapalo."

ESMERALDAS: San Lorenzo, altitude about 10 m, April 23, 1943, *Little 6355* (Forest Service no. 98245; U. S. Nat. Herb. no. 1857080, TYPE).

In the absence of staminate flowers, this species of *Clusia* L. cannot be definitely placed as to section. When more material is available, this species perhaps may be included in subgenus *Thysanoclusia* Vesque, section *Euclusia* Planch. & Triana, according to the summary by A. Engler (*Natürl. Pflanzenfam.* ed. 2, 21: 199–204. 1925). The large, 6- or 7-petaled flowers suggest affinities with this section. This species is readily distinguished by the very high number of carpels, 16–19, apparently more than have been recorded previously in this genus.

Neosprucea pedicellata Little, sp. nov.

Fig. 13

Arbor parva, 10 m alta, trunco 20 cm diametro, ramulis teretibus griseis, minute appresso-pubescentibus. Folia petiolata, petiolis appresso-pubescentibus, 12–16 mm longis; laminae ellipticae, 10–20 cm longae, 6–10 cm latae, membranaceae, basi subrotundatae, apice attenuatae, margine remote obtuseque glanduloso-serratae, e basi distincte triplinerviae, glabrae nervis subtus minute paulo appresso-pubescentibus exceptis. Racemus lateralis latus divergens, pauciflorus (2 vel 3), 5–6 cm longus; rachis et pedicelli subangulati, minute denseque tomentosi; pedicelli 25–30 mm longi; flores magni, albidi, sepala et petala similia, valvata, persistentia, utrinque breviter denseque appresso-tomentosa; sepala 4, basi leviter connata, ovata, 16–17 mm longa, 5–7 mm lata, acuminata, 5–8-nervata; petala 4, ovata, acuta, carinata, 15–17 mm longa; stamina numerosa; filamenta filiformia, 2 mm longa; antherae lineariae, hirsutae, 5 mm longae; receptaculum dense hirtum; ovarium globosum, fere glabrum, 5 mm diametro, semi-5–7-loculare, placentis parietalibus prominentibus; stylus crasse filiformis, 9 mm longus; stigmatibus truncato. Fructus deest.

Small tree about 10 m. tall and 20 cm. in diameter, wet tropical forest.

PICHINCHA: Santo Domingo de los Colorados altitude about 560 m, April 2, 1943, *Little 6152* (Forest Service no. 96909; U. S. Nat. Herb. no. 1858861, TYPE).

Neosprucea Sleumer (Notizbl. Berl. 14: 47. 1938), a monotypic genus of the Flacourtiaceae, was based upon *N. grandiflora* (Spruce) Sleumer (Notizbl. Berl. 44: 47. 1938), originally described as *Banara grandiflora* Spruce (*Journ. Linn. Soc. Bot.* 5. Suppl. 2: 93. 1861). The type was collected at Tarapoto, Peru, by Spruce, and the species now is known from the Atlantic slope in Brazil, Colombia, and Peru. The second species, *N. pedicellata*, represents an extension of range of the genus to Ecuador and possibly the first record on the Pacific slope.

N. pedicellata is a distinct species readily separated from the type species by the following characters: leaves membranaceous (instead of chartaceous); leaves mostly larger, broader, and rounded at base; petioles slightly longer;

greatly elongated pedicels 25–30 mm long; and larger flowers. Though *N. grandiflora* was described by Sleumer with a spikelike raceme and pedicels only 2 mm. long, Mutis' specimens from Colombia have pedicels 10 to 20 mm. long.

***Symplocos ecuadorensis* Little, sp. nov.**

Fig. 11

Subgenus *Eusymplocos* Brand, sect. *Symplocastrum* Brand, subsect. *Ciponimastrum* Brand. Arbor 15 m alta, trunco 20 cm diametro. Ramuli leviter hirsuti. Folia petiolata, petiolis hirsutis, 5–8 mm longis; laminae oblanceolatae, 5–10 cm longae, 2.5–4 cm latae, basi cuneatae, apice abrupte acuminatae, remote crenulatae, subcoriaceae, lucidae, supra glabrae, subtus parce hirsutulae, costa et venis primariis subtus prominentibus. Paniculae axillares, 1–2 cm. longae, rachibus hirsutis, bracteis ovatis, hirsutis, ciliatis, 1 mm longis; flores 7–8 mm longi, subsessiles; calyx 2–2.5 mm longus, hypanthio campanulato ca. 1 mm longo, glabro, lobis 5, late ovatis, ciliatis, 1–1.5 mm. longis; corolla alba, 6–7 mm longa, tubo ca. 3 mm longo, lobis 5, ellipticis, obtusis, apice ciliolatis, 3–4 mm longis et 2 mm latis; tubus stamineus tubo corollae adnatus, 1 mm longus; stamina 28–32 triserialia; filamenta complanata, 0.2–2.5 mm longa; ovarium fere omnino inferum, 1.5 cm. altum, apice pilosum, 3- vel 4-lobulatum. Fructus baccatus; cylindricus, lobis calycinis et basi styli coronatus, 10 mm. longus, 5 mm diametro, 3- vel 4-ocularis.

Tree 15 m tall and 20 cm in diameter. Two trees were seen in a pasture, cleared wet tropical forest.

ESMERALDAS: San Lorenzo, altitude about 10 m, April 22, 1943, *Little 6349* (Forest Service no. 98370; U. S. Nat. Herb. no. 1858685, TYPE).

Though the genus *Symplocos* Jacq. is widely distributed with about 300 species in tropical and subtropical America, Asia, and Australia, most species have restricted ranges. This material from the poorly explored Ecuadorian province of Esmeraldas could not be assigned

to any of the species from northwestern South America.

***Aspidosperma elatum* Little, sp. nov.**

Fig. 19

Arbor magna, 35 m alta; trunco 1 m diametro, profunde sulcato et angulato. Cortex fere laevis, leviter fissus, albido-griseus. Ramuli subteretes, puberuli. Folia alterna, non congesta, internodiis 4–7 cm longis, petiolata, petiolis fusco-puberulis, 1 cm longis; laminae magnae, oblongo-oblanceolatae, chartaceae, 22–26 cm longae, 7–9 cm latae, basi subrotundatae, apice acutae vel obtusae, fere glabrae, supra virides, subtus glaucescentes, costa leviter puberula, supra canaliculata, subtus elevata, nervis lateralibus utrinque 13–16, fere rectis, prope marginem leviter arcuatis, subtus elevatis, secundariis inconspicuis. Inflorescentiae desunt. Mericarpia magna, compressa, suborbicularia, 10–12 cm longa, 9–10 cm lata, 2 cm crassa, externe dense fusco-tomentosa, pericarpio lignoso, 5–8 mm crasso; semina plano-compressa, suborbicularia, 9 cm longa, 7 cm lata, alis latis, papyraceis.

Large tree of forest canopy, to 35 m tall and 1 m in trunk diameter. Easily recognized in the field by the odd, fluted trunk with deep, branching, vertical grooves. Bark smoothish, slightly cracked, whitish-gray. Wet tropical forest at Pichilingue. "Naranjo de monte."

Los Ríos: Pichilingue, altitude about 45 m, May 25, 1943. *Little 6517* (Forest Service no. 98223; U. S. Nat. Herb., TYPE).

The genus *Aspidosperma* Mart. & Zucc. is widely distributed in tropical America from Mexico and the West Indies to Brazil and Argentina, centering in Brazil and represented in northwestern South America by only a few species. Four species were recorded from Colombia by Standley (*Trop. Woods* 36: 13–20. 1933). The herbarium material of *Aspidosperma elatum*, which consists of foliage and detached fruits, seems sufficiently distinctive, as the leaves and fruits are larger than in most species. Apparently this is the second species of *Aspidosperma* recorded from Ecuador.